■ APPENDIXES

A. Safety rules for overhead rigging (applicable if the PS020A DMX-controlled 3-Channel power supply is mounted to any of the Multiform LS series passive RGB LED panels):

Risk of injury: Overhead mounting requires extensive experience, including among others calculating working load limits, good knowledge of the installation material being used, and periodic safety inspection of all installation material and the unit. If you lack such qualifications, do not attempt the installation yourself. Improper installation can result in body injury. Be sure to complete all rigging and installation procedures before applying power to the unit.

- The unit should be installed out of reach of people and outside areas where persons may walk by or be seated.
- Make sure that the installation area can hold a minimum point load of 10 times the device's weight.
- In fixed installations, fix the unit with self-locking screws/nuts to the mounting point.
- When mounting the unit to truss be sure to secure an appropriately rated clamp to the hanging yoke using a M10 screw fitted through the center hole of the hanging yoke.
- Always use a certified safety cable that can hold 12 times the weight of the device when installing the unit. This secondary safety attachment should be installed in a way that no part of the installation can drop more than 20cm if the main attachment fails.
- Never stand directly below the device when mounting, removing, or servicing the fixture. Make sure the area below the installation place is free from unwanted persons during rigging, de-rigging and servicing.
- The operator has to make sure that the safety-relating and machine-technical installations are approved by an expert before using them for the first time. The installations should be inspected every year by a skilled person to be sure that safety is still granted.

USER MANUAL

PS020A

DMX-controlled 3-Channel power supply

MULTIFORM

Updated versions of this document may be available at
WWW.MULTIFORM-LIGHTING.COM

RevA 06/2007 Order code: 12-010-0233-80100-1-01

■ Introduction

Dear customer,

congratulations on the purchase of a Multiform-branded item and the trust having been put in us with this decision. Multiform is one of the leading global manufacturers of professional lighting equipment and has decades of experience in design, production and quality assurance.

To meet your requirements, this unit has been designed and built to the highest standards, so that we can assure you that you have made a good and satisfying investment. To take full advantage of all possibilities and for your own safety and the safety of your environment, please read these operating instructions carefully before you start using the unit.

■ Product description

The PS020A DMX-controlled 3-Channel power supply is a versatile unit that integrates power supply and control functions for the Multiform LS series of passive RGB LED panels, such as:

The **Multispot** ® LS1310 passive RGB LED panel

The **Multiwash** ® LS1130 passive RGB LED panel

The **Multiflood** ® LS3042 passive RGB LED panel

For extended user advice, please refer to the respective panel's user manual.

■ Security advice before use

Warning: Read this section carefully before installing, powering, operating, cleaning or servicing this product!

The following symbols are used to identify important safety information in this manual:

DANGER!
Safety hazard. Risk of injury or death.

WARNING!
Hazardous voltage. Risk of severe or fatal electric shock.

WARNING!
Fire hazard.

WARNING!
Read manual before installation and operation.

■ Technical data PS020A DMX-controlled 3-Channel power supply:

Mains Input……85-240V AC / 50-60Hz
Type……..switch mode power supply
Power Consumption……max. 48W
Fuse……250V 2A T (slow blow, 5x20mm glass)
Sound control……..…internal microphone with Automatic Gain Control (AGC)
DMX connections……3 pin XLR (Male / Female)
Modulation Type……Advanced Bit Angle Modulation (ABAM)
Control protocol.....DMX 512 (1990)
Dimensions……..W 135 x H 109 x D 38 mm
Weight ……0,6 kg

■ Standards

This product complies with the following standards:
EU safety.....EN 60065:2001 +A1
EU EMC.....EN61204-3:2001
US safety (pending)……UL60065
US EMC……..FCC Part 15

This product meets both the EMC Directive 89/336/EEC and the Low Voltage Directive 73/23/EEC.

Maintenance (Boot loader)

The Maintenance (boot loader) function enables the unit to receive firmware updates via the DMX connectors. For further information refer to the website www.multiform-lighting.com and check "Download".

Switch on condition

The unit always returns to the last mode before it was switched off. In DMX Slave "SLA" or DMX Mode "d" or DMX Preset Mode "P" all DMX values are cleared (LED's off) if power is switched off.

DMX signal drop condition

The device will retain the status that it was in before the DMX signal got lost, but potential strobe settings will be automatically cleared.

DMX channel assignment overview:

Mode > DMX	A	C	P (CH3<50)	P (CH3>50)	d	SLA
CH1	Red	Red	Colour	Pattern	Red	Red
CH2	Green	Green	Dimmer	Dimmer	Green	Green
CH3	Blue	Blue	0-49	Speed	Blue	Blue
CH4	0	0	Strobe	Strobe	Dimmer/Strobe	0

■ Maintenance

This unit does not need regular maintenance. The internal circuit is protected by a 250V/2A slow-blow fuse 5x20mm fuse. If this fuse fails, this usually indicates an internal fault requiring servicing by a qualified engineer. The fuse shall only be replaced by a fuse of same specification, and the replacement has to be made by qualified personnel obeying applicable safety rules.

General advice:

1. Read this manual completely before using the product.
2. Keep this manual in your records for future reference.
3. Follow all instruction printed in this manual, otherwise warranty may be void.
4. Follow all printed security advice on the product itself. The lighting flash with arrowhead within an equilateral triangle makes you aware of non-insulated AC mains voltage inside the unit. The exclamation mark within an equilateral triangle makes you aware of important operating and maintenance instructions in the literature attached to this product.
5. Take care of enough distance between this product and sources of hum and noise like electric motors and transformers.
6. Carry this product with greatest care. Punches, big forces and heavy vibration may damage this product mechanically.
7. The manufacturer takes no responsibility for injury or damage caused by not following the safety precautions and instructions printed in this manual.

Protection from electric shock:

1. Do not connect the AC power plug to the unit before assembly has been completed.
2. Only connect this unit to a mains socket outlet with protective earth connection, ground-fault (earth-fault) protection and overload protection.
3. Where the mains plug or an appliance coupler is used as a dis-connect device, the disconnect device shall remain readily operable.
4. To pull the AC Cord out of the wall outlet or the unit's AC socket, never pull the cable itself, but only the AC plug.
5. Disconnect the unit from AC supply by pulling the AC plug out of the wall outlet or the unit's AC socket before any kind of cleaning on the product. Use smooth and dry cloth only for cleaning. Check all connection cables before reconnecting the unit.
6. Do not expose this unit to any dripping or splashing liquids, and do not place objects filled with liquids, such as vases, on the unit. Do not operate this unit near to open water or in high humidity.
7. Choose the position of the AC cord according to the lowest risk of damage by foot steps or by squeezing it. Take especially care of the AC cord outlet on the unit as well as the AC plug and wall outlet at the other end of the cable.
8. Do not open the unit for service purpose, as there are no user-serviceable parts inside. Warranty will be void in any case of unauthorized service by the user or other not authorized persons.

Protection from fire:

1. Take care of not placing the unit near sources of heat (e.g. powerful amplifiers, fog machines).
2. Take always care of sufficient air convection in the unit's environment to avoid overheating, especially when mounting in a closed environment. Make sure air convection slots are not blocked. Do not operate this unit in environmental temperatures exceeding 40 degrees Celsius.
3. Check the total maximum power of your AC wall outlet if you connect several units to one wall outlet and avoid any overloading.

Protection from injury and damage:

1. Never use any accessories or modifications not authorized by the manufacturer of this unit.
2. Choose a location for operation where the unit is protected from vibration and where a fixed mounting position is provided. In case of overhead-mounting, follow appropriate rigging rules and your country's regulations for rigging safety. See appendixes if any.
3. Before plugging the AC cord in the wall outlet, check whether the AC mains voltage and frequency is the same as this product is specified for. Whenever your AC plug should not match the wall outlet, contact you dealer immediately.
4. If fluids have spilled into the unit or small parts have intruded the unit, immediately switch off the unit and hand it over to the authorized service for a security check.
5. Disconnect the unit from AC supply by pulling the AC plug out of the wall outlet or the unit's AC socket during a thunder-storm in order to avoid any damage on the unit due to AC voltage peaks.
6. In cause of not correct function of this unit or damaged AC cord or other damaged parts, pull immediately the AC plug out of the wall outlet and hand the unit over to the authorized service for a security check.
7. To meet all aspects of functionality and security during maintenance work to be preformed on this unit, all parts should be replaced by genuine spare parts. Consequently, take care of your dealer or maintenance company to be authorized by the manufacturer.

■ Health advice

This unit produces and absorbs electromagnetic radiation. The strength of radiation and the sensitivity for disturbing interference matches the CE and FCC requirements. A corresponding sign is printed on the backside of the unit. Any change or modification may affect the behavior of the unit concerning electromagnetic radiation, with the CE requirements eventually not to be met any more. The manufacturer takes no responsibility in this case.

The pre-programmed soft fade or hard switching patterns can be chosen by means of CH1 whilst CH2 is used as a dimmer channel. CH3 allows to set the fade time or pattern speed from slow (value 50) to very fast (value 255). If channel 4 reaches a DMX value of 50 or above a strobe will be added to the chases. The strobe speed can be adjusted from slow (value 50) to 23 flashes per second (value 255).

Note: Whether the unit works in static colour mode or pattern mode only depends on the value of channel 3. So make sure the value of channel 3 is lower than 50 to be in static colour mode. Otherwise you will be in pattern mode.

In this mode the potentiometer (1) is disabled.

Addressing has to be done as follows:

001	first device	(CH 1-4)	*factory default*
005	second device	(CH 5-8)	
009	third device	(CH 9-12)	
013	fourth device	(CH 13-16)	and so on.

This setting is stored even if the device is switched off.

Display on/off

If you wish the display to be lit only when a change in operation is made, the DIP switch (10) should be in the position off. Now if any of the buttons is not pressed for more than approximately 25 seconds the display is switched off. As soon as one of the buttons is pressed again, the display switches on immediately. In this case the first touch of the button is ignored in respect to the normal function of that button.

Key lock

Pressing the MODE button (5) for longer than 3 seconds locks all the buttons (5-7) and the potentiometer (1). The display shows "LOC" in alteration to the mode (changing every 2 seconds). Pressing the MODE button again for more than 3 seconds unlocks the button- and potentiometer-functions. Please note: If the display is in OFF-mode it will take approximately 25 seconds before the display switches off. It will be switched on again if any key is touched and will switch off again after 25 seconds if the keys are not unlocked by the procedure mentioned above.

Termination

To avoid interference the last unit of a DMX-chain should be terminated. Therefore the DIP switch (9) of the last unit in the DMX-chain must be switched ON.

"P" DMX Preset Mode

If you want to run the pre-programmed patterns and scenes by an external DMX-controller you can use the DMX Preset Mode. Press the MODE button (5) until the display shows "P", indicating operation in "P" (DMX Preset) mode. Set the DMX starting address by simply using the UP/DOWN buttons (6/7). The chosen DMX-address comes effective approximately 3 seconds later and will show up on the display (2) in alternation to the "P".

The unit receives DMX values on a packet of four channels and mirrors the received data on the DMX output (13). If a DMX signal is present the DMX LED (3) will turn on. The four channels control the unit as follows:
If DMX-value of channel 3 is **lower than 50** the unit works with static colours:

DMX Channel	Value Range	Function
CH1	000-255	Colour choice from presets (see "C" mode)
CH2	000-255	Dimmer
CH3	000-049	Static colour mode active
CH4	000-049	Strobe off
	050-255	Strobe (050=slow / 255=max. speed 23 Hz)

Colour presets can be activated by means of CH1 whilst the chosen colour can be dimmed by weighting the colour balance with CH2. If the value of CH4 is above 50 the unit is set to strobe mode. The strobe speed for any fixed colour chosen on the first channel can be adjusted from zero (value <50) to 23 flashes per second (value 255).

If DMX value of channel 3 is **equal or higher than 50** the unit works in pattern mode:

CH1	Pattern	CH1	Pattern
000-015	Soft fade red-green	136-150	Hard switch green-blue
016-030	Soft fade green-blue	151-165	Hard switch red-blue
031-045	Soft fade green-blue	166-180	Hard switch red-yellow
046-060	Soft fade red-yellow	181-195	Hard switch candy-lime
061-075	Soft fade candy-lime	196-210	Hard switch pink-blue
076-090	Soft fade pink-blue	211-225	Hard switch turquoise-pink
091-105	Soft fade turquoise-pink	226-240	Hard switch red-green-blue
106-120	Soft fade red-green-blue	241-255	Hard switch red-yellow-green
121-135	Hard switch red-green		-turquoise-blue-pink

DMX	Value range	Function
CH2	000-255	Dimmer
CH3	050-255	Chase speed
CH4	000-049	Strobe off
	050-255	Strobe (050=slow / 255=max. speed 23 Hz)

■ Functional advice

This unit is immune to the presence of electromagnetic disturbances – both conducted and radiated - up to a certain level. Under peak conditions, the unit is classified to show a "class C" performance criteria and may encounter temporary degradation or loss of function which may need manual help to recover. In such case, disconnect the AC power from the unit and reconnect it again to recover.

■ Environmental advice

This unit is build to conform to the ROHS standards and the WEEE directive 2002/96/EC of the European Parliament and of the Council of the European Union. Under these regulations, the product shall not be discarded into regular garbage at the end of its life, but shall be returned to authorized recycling stations.

■ Unpacking

Please check that the box contains the following items:

Main parts:
1 pcs. PS020A main unit
1 pcs. mains cable
1 pcs. operation manual

Accessory parts:
1 pcs. Mounting cover
2 pcs. Mounting screw
1 pcs. connection cable to panel

If any part is missing, please contact your dealer immediately for replacement.
Note: Your dealer may have chosen to pre-assemble this product with any suitable of Multiform's LS series passive RGB LED panels for you. In this case, the above accessory parts have already been used during assembly.

■ Getting started: connecting/assembly

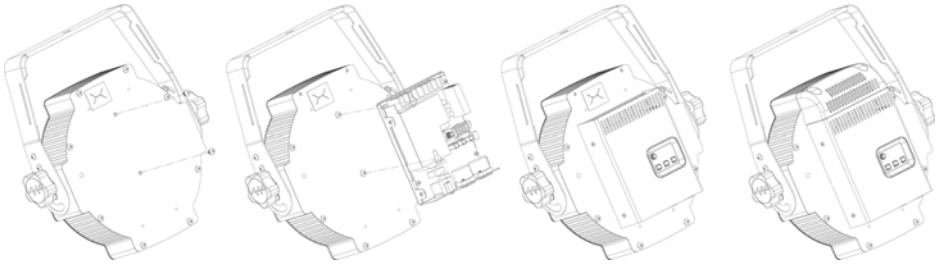
In case your dealer did not pre-connect/assemble the unit for you with any of Multiform's LS series passive RGB LED panels, you need to connect/assemble it before use.

Risk of electric shock: Do not connect the mains cable before the following steps are accomplished!

For assembly, there are two basic choices:

1) Fix the PS020A DMX-controlled 3-Channel power supply on a wall by using two screws at the correct distance which do not protrude more than 4mm from the wall surface. Fix the screws on the wall first, then slide the PS020A DMX-controlled 3-Channel power supply on the screws using the slots on the rear side. Remove the cover of the PS020A DMX-controlled 3-Channel power supply and fix the wall screws through the holes provided in the units PCB. Re-fit the cover of the PS020A DMX-controlled 3-Channel power supply. Plug the optional extended connection cable into the PS020A DMX-controlled 3-Channel power supply on one side and the passive RGB LED panel on the other side until the locking mechanism of the connector is secured. Plug in the mains cable to the unit and verify the display shows “A1”. (NOTE: “A1” is only shown if no external DMX signal is supplied to the unit). Connect external DMX connections if any.

2) Fix the PS020A DMX-controlled 3-Channel power supply on the back of a Multiform LS series passive RGB LED panel (see illustration below, showing LS1310). Fix the screws to the LED panel into the provided mounting points first [1], leaving some clearance to slide on the PS020A DMX-controlled 3-Channel power supply. Then slide the PS020A DMX-controlled 3-Channel power supply on the screws using the slots on the rear side [2]. Remove the cover of the PS020A DMX-controlled 3-Channel power supply and fix the screws through the holes provided in the units PCB. Re-fit the cover of the PS020A DMX-controlled 3-Channel power supply [3]. Plug the provided connection cable into the PS020A DMX-controlled 3-Channel power supply on one side and the RGB LED panel on the other side until the locking mechanism of the connector is secured. Get the black plastic cap fixed at the top end to cover the cable and to fix the power supply itself from sliding off. Use the two black screws [4]. Plug in the mains cable to the unit and verify the display shows “A1”. (NOTE: “A1” is only shown if no external DMX signal is supplied to the unit). Connect external DMX connections if any.



1 2 3 4

“SLA” DMX Slave Mode

Press the MODE button (5) until the display shows “SLA”, indicating operation in “SLA” (SLAVE) mode. In this mode the unit is set to DMX-channel 001 in order to receive the signals from a master-unit of the Multiform LS series being in mode "A" or "C". The unit interprets CH1 as red intensity, CH2 as green intensity and CH3 as blue intensity. CH4 is not in use, and the potentiometer (1) is disabled.

This mode can also be used for remotely controlling the unit if no specific DMX address is needed and channels 001-003 can serve as a default. To indicate that the unit is controlled by an external DMX signal, the DMX LED (3) is lit.

“d” Mode (DMX Mode)

Press the MODE button (5) until the display shows “d”, indicating operation in “d” (DMX) mode. Shortly after that, the display shows the DMX starting address. You can choose any DMX starting address by simply using the UP/DOWN buttons (6/7). The chosen DMX-address comes effective approximately 3 seconds later and will show up on the display (2) in alternation to the “d”. This allows control of the unit by any external DMX signal sending on the chosen channel.

In this mode the potentiometer (1) is disabled.

The unit receives DMX values on a packet of four channels and mirrors the received data on the DMX output (13). If a DMX signal is present the DMX LED (3) will turn on. The four channels control the unit as follows:

DMX channel	Value Range	Function
CH1	000-255	Red intensity
CH2	000-255	Green intensity
CH3	000-255	Blue intensity
CH4	000-127	Master dimmer
	128-227	Strobe (128=slow / 227=max. speed 23 Hz)
	228-255	Master dimmer full on, Strobe off

Addressing has to be done as follows:

001 first device	(CH 1-4)	*factory default*
005 second device	(CH 5-8)	
009 third device	(CH 9-12)	
013 fourth device	(CH 13-16)	and so on.

This setting is stored even if the device is switched off.

A16	Hard switch turquoise-pink	Sound-to-light, Speed
A17	Hard switch red-green-blue	Sound-to-light, Speed
A18	Hard switch red-yellow-green-turquoise-blue-pink	Sound-to-light, Speed
A19	Random speed red-yellow (Fire)	None
A20	Random speed green-blue (Ocean)	None
A21	Random speed red-blue	None
A22	Random speed red-green-blue (RGB)	None
A23	White strobe	Sound-to-light, Speed
A24	Red strobe	Sound-to-light, Speed
A25	Green strobe	Sound-to-light, Speed
A26	Blue strobe	Sound-to-light, Speed
A27	Strobe chase red-green-blue	Sound-to-light, Speed

"C" Colour Mode

Press the MODE button (5) until the first digit on the display shows "C", indicating operation in "C" (COLOUR) mode. Then choose by using the UP/DOWN buttons (6/7) one of the 19 preset colours as shown in the list below. Changing the setting becomes effective directly. Knob (1) determines the dimming level.

In "C" mode, the unit does not receive any values from the DMX input but generates related DMX values on the output according to the selected pattern, so that other similar units from the Multiform LS series of LED devices can show the same colour if they are connected by DMX signal cables and set to Slave Mode "SLA".

NOTE: The "C" Mode is automatically disabled and can not be chosen when an external DMX signal is received [DMX indicator LED (3) is lit].

If you leave mode "C" for any reason and come back later into mode "C", the unit will recall the last chosen colour (even if the unit was switched off in between).

Available colour presets:

C 0	all off	C10	Frog
C 1	Red	C11	Lavender
C 2	Green	C12	Candy
C 3	Blue	C13	Peach
C 4	Yellow	C14	Aqua
C 5	Pink	C15	Leaf
C 6	Turquoise	C16	Purple
C 7	Lime	C17	Barbie
C 8	Orange	C18	Breeze
C 9	Marine	C19	White

■ Getting started: choosing a location

Risk of fire: The PS020A DMX-controlled 3-Channel power supply has been designed to work in dry indoor environments at environmental temperatures up to 40 degrees Celsius. For proper operation, the PS020A DMX-controlled 3-Channel power supply must be operated with its heatsink side up, and unobstructed air convection to the heatsink.

Do not:

- Operate the PS020A DMX-controlled 3-Channel power supply in environments with more than 40 degrees environmental temperature or more than 80% humidity.
- Operate the PS020A DMX-controlled 3-Channel power supply in any position inclined or reclined more than 45 degrees from being upright (heatsink on top).
- Operate the PS020A DMX-controlled 3-Channel power supply in any closed environment smaller than 10cbm, unless forced air convection is provided.

■ Operation

The PS020A DMX-controlled 3-Channel power supply supplies the necessary power to the passive RGB LED Panel unit, plus provides all necessary functional control.

User interface overview:

1 In A-Mode: Speed Control (except A1 = Colour Mix Control)
In C-Mode: Dim-Level-Control
2 Display showing the Mode, DMX-address, LOC-function etc.
3 Indicates presence of a DMX signal
4 Indicates the sound-to-light mode (internal microphone)
5 MODE selection button
6 UP-button
7 DOWN-button
8 Internal microphone
9 Switches on the termination for the last unit in the DMX-chain
10 Switching the display on or off (with delay)
11 Maintenance (not in use)
12 Power-Input 85-240V AC
13 DMX-Output connector
14 DMX-Input connector

Upon the user's choice, the unit can work stand-alone or may be controlled by external DMX-controllers. Available modes:

"A" Auto Mode

Press the MODE button (5) until the first digit on the display shows "A", indicating operation in "A" (AUTO) mode. Then choose your desired pattern by using the UP/DOWN buttons (6/7), see list below. Changing the setting becomes effective 1 second after the new setting is made to allow stepping through presets without previewing all intermediate presets.

NOTE: The "A" Mode is automatically disabled and can not be chosen when an external DMX signal is received [DMX indicator LED (3) is lit].

Whilst being in pattern A 1 (static scene), turning knob (1) determines the colour, whereas being in one of the other 26 patterns, knob (1) controls the speed or selects the sound-to-light function (refer to below pattern list). The sound-to-light function can be activated by setting the knob (1) inside the first 10 degrees of its travel from left detent and it works from a built-in microphone (8) which picks up the environmental sound. Its activity is shown by the flashing of the right dot (4) in the display. The level for all patterns is maximum.

In "A" mode, the unit does not receive any values from the DMX input, but generates related DMX values on the output according to the selected pattern, so that other similar units from the Multiform LS series of LED devices can show the same pattern if they are connected by DMX signal cables and set to Slave Mode "SLA".

If you leave mode "A" for any reason and come back later into mode "A", the unit will recall the last chosen pattern (even if the unit was switched off in between). Pattern list:

#	Description	Function of Knob (1)
A 0	All off	none
A 1	Static scene	Colour
A 2	Soft fade red-green	Speed
A 3	Soft fade green-blue	Speed
A 4	Soft fade red-blue	Speed
A 5	Soft fade red-yellow	Speed
A 6	Soft fade candy-lime	Speed
A 7	Soft fade pink-blue	Speed
A 8	Soft fade turquoise-pink	Speed
A 9	Soft fade red-green-blue (RGB)	Speed
A10	Hard switch red-green	Sound-to-light, Speed
A11	Hard switch green-blue	Sound-to-light, Speed
A12	Hard switch red-blue	Sound-to-light, Speed
A13	Hard switch red-yellow	Sound-to-light, Speed
A14	Hard switch candy-lime	Sound-to-light, Speed
A15	Hard switch pink-blue	Sound-to-light, Speed